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Efficiency Analysis and Marketing Channels of Tilapia Seed Production

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Abstract
Waste is unwanted residual material after the end of a process. The problem of waste has become a global issue that is a threat to the environment if it is not properly managed. Based on data from the Klungkung Regency Environmental Service in 2019, from four sub-districts in Klungkung Regency namely Dawan, Banjarangkan, Klungkung, and Nusa Penida, the volume of waste per day is more than 115,000 kg/person/day from a population of more than 230 thousand people, when compared production average waste production weighing 0.5 kg per person/day. Meanwhile, in terms of composition, the highest amount of waste is organic waste (68%), dust, rock and the like (8%), glass and plastic bottles 7%, followed by sheet plastic 5% and plastic 4%. The results of the analysis and depiction on the graph of the survey results were 4 (four) villages that had a high percentage of segregation, namely Semarapura Kauh Village (83.33%), followed by Semarapura Tengah (82.23%), followed by Semarapura Kangin Village (78.87. %) and Semarapura Kaja (75.21%). The results of this study prove that two locations have a very low level of sorting waste (less than 50%), namely Jempriring street in Semarapura Klod (47.61%), Rama street (42.11%), and Puputan street in Semarapura Kangin (44.73%). From this research, it can be concluded that public awareness of sorting waste in the two locations is still lacking.

Keyword: Farmer share; nursery; marketing margin.

1. Introduction

Tilapia hatchery is one of the efforts to increase the amount of production in aquaculture activities to support rearing activities to produce consumption fish. Tajen Village, Tabanan Regency has a continuously available water source so that it supports tilapia cultivation, especially nursery businesses to produce tilapia seeds. So that in this area, the tilapia seed nursery business is easy to develop considering that market demand is still high and until now the market opportunity is open, especially to meet the business needs of tilapia rearing in Floating Bag Nets in Lake Batur Kintamani. One of the aquaculture businesses that have good prospects for development is a nursery, namely the enlargement of tilapia from a basic seed size of 1-2 cm to an average length of 9 cm with a maintenance period of about 3 months. The Mina Guna Sejahtera group carried out this nursery business considering that the demand for medium-sized tilapia seeds was still high, especially meeting the demand for the business of increasing the size of consumption in the Floating Net Bags of Lake Batur Kintamani.

One of the considerations for cultivators of floating net cages in Lake Batur is to use tilapia because tilapia seeds have advantages over carp fry, including tilapia seeds that are more resistant to changes in water quality that often occur up willing, growth is classified as fast, white tilapia flesh is solid and slightly thorny. The marketing of tilapia seeds produced by the Mina Guna Sejahtera group is sold through intermediary traders, namely through the supply chain process. A supply chain is a supply and demand network that includes suppliers, in this case, middlemen, wholesalers, and end consumers. With the aim of quick response to market demands and effective cooperation in quality control and cost reduction. The term supply chain (supply chain) was popularized as an inventory management approach that emphasizes the supply of raw materials.

Supply chain management is the integration of planning, coordination of all processes, and business activities to deliver superior product value to consumers and as a whole to meet the satisfaction needs of interested parties in the supply chain system. A supply chain is a physical network and related activities with the flow of materials and information within or across boundaries. The supply chain is a system where an organization distributes its products and services to its consumers [1]. Supply chain management is the management of the flow of materials, information, and finance through a network of organizations (i.e. suppliers, processors, logistics providers, wholesalers/distributors, and retailers) that aims to produce and deliver products or services to customers. The supply chain is a network of companies that work together to create and deliver a product into the hands of the final consumer [2].

These companies usually include suppliers, manufacturers, distributors, stores or retailers, as well as supporting companies such as logistics service companies. Supply chains in several fields show results that have not been maximized, including waiting times that are too long from producers to consumers [3]. Hasil penelitian [4] diperoleh efisiensi pemasaran ikan gurami di Jembrana sebesar 12,4% sehingga pola pemasaran yang digunakan dapat dikatakan cukup efisien. Sedangkan hasil penelitian [5], menunjukkan bahwa efisiensi pemasaran udang galah di Gianyar sebesar 11,50% dan di Karangasem 10,6%, dan pola pemasarannya dapat dikatakan cukup efisien. The supply chain has a dynamic nature but involves three constant flows including product flow, financial flow and information flow. However, the main purpose of the supply chain is still to meet consumer needs [6]. However, it is more clear that the supply chain is more focused on all activities related to meeting consumer needs in which there is a flow and transformation of goods from the supply of raw materials to the final consumer which is accompanied by the flow of information including financial flows. To find out the supply chain in the marketing of tilapia seeds produced by farmers, it is necessary to analyze marketing channels and marketing efficiency of tilapia seeds produced by the Mina Guna Sejahtera farmer group because they are related to supply and continuity of the marketing business of tilapia seeds produced. To find out the marketing channels and marketing efficiency that occurs in the marketing of tilapia seeds in the Mina Guna Sejahtera farmer group in Tajen Village, Tabanan Regency, because it is related to the selling price and the continuity of the nursery business of tilapia produced by farmers.

2. Materials and Methods

2.1. Location and Time

The survey of efficiency analysis and marketing channels of tilapia seeds conducted in this study was aimed at the Mina Guna Sejahtera farmer group, Tajen Village, Tabanan Regency. And the research approach used a descriptive method with case study research in April 2021.

2.2. Data Types and Sources

The data used in this study are primary and secondary data obtained through interviews with cultivators and intermediary traders. Primary data consists of respondent identity data, which includes education level, gender, age of business duration, business orientation as well as data on business fields covering cultivation location, production capacity, price of production in each marketing channel. While secondary data was obtained from the head of the Mina Guna Sejahtera farmer group, Tajen Village, Tabanan Regency regarding the number of group members and intermediary traders involved in marketing tilapia seeds.

2.3. Sampling Technique

Sampling in this study used purposive sampling, which was deliberately chosen [7] by interviewing 10 members of the cultivator group and 1 middleman who bought and marketed tilapia seeds produced by the Mina Guna Sejahtera farmer group, Tajen Village, Tabanan Regency. Interviews were aimed at members of the Mina Guna Sejahtera farmer group, Tajen Village, Tabanan Regency to obtain data on selling prices and selling prices from intermediary traders to consumers of the Lake Batur Floating Net Bags Bangli.

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2.4. Marketing channel

The marketing chain describes a marketing channel that is longer and reaches from raw materials to final products which are then delivered to buyers [8]. In the marketing of agricultural commodities, a long marketing chain is often encountered and involves many marketing actors.

According to [9], the length of the marketing channel through which a commodity passes depends on several factors, namely:

a. distance between producer and consumer
   The farther the distance between producers and consumers, the longer the marketing channel.
b. Fast or not the product is damaged
   If the product is fast or perishable, then the product requires a short and fast marketing channel.
c. Production Scale
   If the production takes place in small sizes, then the number of products produced in small or small. This will be advantageous if producers go directly to the market. In such circumstances, the presence of intermediary traders is not required.
d. Entrepreneur's financial position
   Producers with strong financial positions tend to shorten marketing channels and perform more trading functions than traders with weak capital positions.

2.5. Farmer Share

Farmer's share is one of the indicators in measuring the performance of a trading system, this analytical tool is often used to determine the efficiency of the trading system in terms of farmers' income. However, a high farmer's share does not indicate that marketing is running efficiently. This is related to the size of the benefits added to the product (value-added) carried out by intermediary or processing institutions to meet consumers. The factor that needs to be considered is not the size of the share, but the total revenue obtained by producers from the sale of their products.

Farmer's share is the difference between retail price and marketing margin [10]. A farmer's share is part of the consumer price received by farmers and is expressed as a percentage of consumer prices. This is useful for knowing the portion of the prevailing price at the consumer level enjoyed by farmers. The amount of farmer's share is usually influenced by: 1). Processing rate, 2) Transportation costs, 3) Product durability and 4) Number of products.

One of the analytical methods to calculate the efficiency of trading activities is to compare the price paid by consumers to the price of the product received by the farmer (farmer's share). The share received by marketing agencies is expressed in percentage terms Farmer's share as the difference between retail price and marketing margin [11]. The value of the farmer's share can be calculated systematically, as follows::

$$farmer's\ share = \frac{Pf}{\Pr} x100\%$$

Information :
Pf = farm-level price
Pr = the price paid by the final consumer

Farmer share is related to marketing margin and has a negative relationship. Where the lower the marketing margin, the higher the farmer's share received by the farmer.

2.6. Marketing Margin

Marketing margin is the price difference that occurs in each marketing agency involved in the business of selling tilapia. According to [12] to determine the marketing margin required data that includes the price of fish, costs incurred, and profits earned by traders. Marketing margin is the difference between the price paid to producers and the price paid by consumers. Marketing margin is determined from the number of marketing costs and profits from each marketing

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agency. From the observations during the research, the costs incurred in marketing tilapia include transportation costs and harvest costs.

2.7. Marketing Efficiency

Marketing activities for fishery products are not only the process of transferring products from producers to consumers, there are also other processes.

These processes include collection, sorting, distribution, and including the selection of marketing channels. Where the process raises costs which are then calculated in commodity prices. The impact can increase prices to consumers and suppress prices at producers so that it is necessary to make efficient in marketing.

An efficient marketing system will lead to lower marketing margins due to lower input costs from marketing activities. So that the income of producers increases. Relatively cheaper prices for consumers and higher product competitiveness. Thus, fair profit sharing is achieved for the marketing agency actors. According to [13] marketing is said to be efficient if it fulfills two conditions, namely being able to deliver results to consumers at low costs, and being able to hold a fair share of the total price paid by consumers to parties involved in the production and trading activities of the goods.

Calculation of the marketing efficiency of tilapia in the Tajen Village area, namely the total marketing costs divided by the price at the consumer level, obtains a marketing efficiency of 12.4%. Thus it can be said that the marketing of tilapia in the Tajen Tabanan Village area by using marketing channels involving intermediary traders can be said to be efficient because marketing efficiency is in the range of 0 – 33% [14].

Marketing efficiency indicators can be measured by the following criteria::

1. If the share received by farmers is greater and the share received by farmers is close to 100%, then the marketing channel is categorized as efficient.
2. If the share of the price received by farmers is smaller and the share of the marketing margin is large, then the marketing channel can be categorized as inefficient.
3. To find out about marketing efficiency, the following formula can be used:

$$Ep = \frac{marketingfee}{marketedproductvalue} x100\%$$

With decision-making criteria.

1. 0 – 33% = efficient
2. 34 – 67% = less efficient
3. 68 – 100 % = not efficient

2.8. Data analysis

Data analysis in this study is qualitative and quantitative data. Qualitative data on marketing channels used by farmers and intermediary traders, while quantitative data on the number of farmers, selling prices from farmers, and selling prices from intermediary traders to consumers on marketing channels used by producers. The data obtained through this interview will be obtained regarding marketing channels for tilapia marketing and prices at the farm level and the level of intermediary traders. The instrument used in this study was an interview guide in the form of a list of direct questions to farmers and intermediary traders. Records or documentation related to interviews were carried out on the number of group members and the number of intermediary traders.

The analysis was used in the form of descriptive and qualitative data. Descriptive data analysis explains marketing channels in the marketing of nursery-raised tilapia seeds, while quantitative analysis is used to determine the difference between prices for farmers and selling prices for retailers to consumers. The quantitative approach is based on numbers while the qualitative approach is in the form of categories.

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3. Results and Discussion

During the study, interviews were conducted with the respondents, namely 10 tilapia farmers, and 1 intermediary trader, all of whom were male. The results of interviews with respondents are shown in the following table.

Table 1. The results of interviews related to the characteristics of tilapia farmers in the Mina Guna Sejahtera farmer group

No	Characteristics of Farmers/Cultivators	Research variable	Number of Respondents (org)	Percentage (%)
1.	Age	a. 31-40 year	1	10
		b. 41-50 year	7	70
		c. > 51 year	2	20
2.	Gender	a. Man	10	100
		b. Woman	-	-
3.	Level of education	a. No. never went to school	-	-
		b. SD	-	-
		c. SLTP	1	10
		d. SLTA	9	90
		e. College	-	-
4.	Type of business	a. Nursery of tilapia	10	100
		b. magnifying	-	
		c. Breeders & Enlargers	-	-
5.	Business Orientation	a. Main Business	-	-
		b. Side Business	10	100
6.	The duration of tilapia cultivation	a. < 5	-	-
		b. 5 – 10 year	10	100
		c. > 10 year	-	-
7.	Production Results Each Period (3-4 months)	a. < 5000 ekor	3	30
		b. 5000 - 10000 ekor	6	60
		c. > 10000 ekor	1	10
8.	Tilapia Fish Sales System	Directly at the group	10	100
		Through the market	-	-
		Through both	-	-
		. Through other ways	-	-
9.	The results of selling tilapia	. . Relatively the same	10	100
		. Lower		
		. Uncertain	-	-
10.	How to get Price Information	Trader	10	100
		. Friends/Family/	-	-
		Colleagues Cultivator	-	-
		Others (a and b)	-	-

Source: Mina Guna Sejahtera Farmers Group, 2021

From this table, 10 of the tilapia nursery businesses in the Mina Guna Sejahtera Group are all male. With the highest age range in the age range of 41-50 years, namely 7 people, the youngest age is 1 age <40, as many, as 2 are over 50 years old. Based on the level of education, most farmers graduated from high school as many as 9 people and the rest graduated from junior high school as many as 1 people. The type of business carried out is all tilapia rearing, namely tilapia nursery producing tilapia seeds measuring 9-10 cm with an average maintenance period of 3 months which are marketed to meet the demand of tilapia growers in Floating Net Bags in Lake Batur Kintamani. The business occupied by members of the farmer group is a side business, meaning that they do not rely on tilapia cultivation as the main business because the producers of tilapia seeds from this nursery all have other businesses such as raising livestock and rice farmers. In carrying out the cultivation of tilapia, farmers in this group are quite long, ranging from 5-10

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years. The production of each farmer ranges from 5,000 to 10,000 heads. So far, the business of growing tilapia to reach the consumption size has not yet developed in the Tajen Village area and farmers have not been able to market it directly to consumers in the Tajen Village area and its surroundings so that the marketing of farmers' products in the Mina Guna Sejahtera group is fully marketed to the Kintamani area in Floating Net Bags in Lake Batur. Marketing of products is not directed to consumers but relies on the role of intermediary traders or collectors to be then handed over to consumers in Lake Batur. Where intermediary traders buy directly from producers, the prices purchased by intermediary traders on farmers are relatively the same from one farmer to another. The involvement of intermediary traders in the marketing of fish fry is related to the distance between producers and consumers, uniformity of seed size, the number of harvests where the number of suitable harvests for intermediary traders is an average of 30,000 heads.

The existence of intermediary traders in this marketing formed marketing channels, namely from farmers' middlemen consumers. All of the products produced by farmers are purchased from intermediary traders because of the cash payment system. The marketing channel used in tilapia marketing is relatively short, involving only one intermediary trader, marketing costs are more efficient and marketing margins are lower. This marketing channel is categorized as efficient. According to [15], the shorter the marketing chain of an item, the lower the cost of trading, the lower the marketing margin, the lower the price paid by consumers, and the higher the price received by the producer. the shortest one where involving one intermediary is the most efficient marketing channel.

The price of tilapia seeds produced by the Mina Guna Sejahtera group obtained between one farmer and another is relatively the same. The price of tilapia seeds at the farmer level is Rp. 300 / head while the middleman sells it to consumers in the floating net cages in Lake Batur Rp. 420/head. The transport capacity is once for every 30,000 birds purchased, while the transportation cost is Rp. 850,000 and other costs such as plastic and packaging Rp. 87 as shown in Table 2.

Table 2 Price of tilapia in marketing institutions, marketing costs, profits, farmer share, and marketing efficiency.

No	Activity	Price (Rp)	Margin	Farmer share
1	Purchase of tilapia seeds from farmers per head	300	120	71,42%
2	Selling price to consumers per head	420		
3	Marketing fee			
	1. Transportation	28		
	2. Packing	5		
4	Profit (Rp)	87		
5	Marketing Efficiency	7.8%		

Source: Primary data, 2021

In the table, the marketing margin for the marketing of tilapia seeds produced by the Mina Guna Sejahtera Group is Rp. Rp. 120 with a farmer share of 71.42%. From the comparison of the marketing margin percentage with farmer share where the marketing margin value is 28% smaller than the farmer share 71.42%, thus this marketing can be said to be efficient because the value (farmer share) received by farmers is greater than the overall marketing margin. According to [14] the smaller the marketing costs, the more efficient marketing is. From the results of the calculation of marketing efficiency where the value of marketing efficiency of tilapia seeds in the Mina Guna Sejahtera Group 7.8% is in the range of 0 - 33%, [14] so it can be said that the marketing of tilapia produced by farmers in Tajen Tabanan Village is efficient. According to [13] marketing is said to be efficient if the product being marketed can deliver results to consumers at a low cost and a fair distribution of all costs paid to consumers to parties participating in the production and trading activities of the goods.

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From this discussion, it can be said that the marketing of tilapia caught by farmers in Tajen Village, Tabanan Regency is classified as efficient because the value received by farmers is greater than the total marketing margin as a whole. Besides that, from the calculation of marketing efficiency, it is 7.8% because it is in the range of 0 - 33%, according to [14], thus the marketing channel for tilapia seeds produced by Mina Guna Sejahtera, Tajen Village, Tabanan Regency is classified as efficient.

4. Conclusion

The Mina Guna Sejahtera farmer group in Tajen Village has so far only produced medium-sized seeds to meet market demand on floating bag nets for consumption of tilapia in Lake Batur and there has been no effort to diversify the business for tilapia enlargement to reach consumption size. The marketing of responsible seeds in the Mina Guna Sejahtera group relies on 1 intermediary who sells to consumers and the marketing channels used are relatively short, namely, from farmers, collectors to consumers with a farmer share value of 71.42%, and marketing margins are lower than the farmer share so that marketing Tilapia seeds produced by the Mina Guna Sejahtera group provide benefits for farmers and intermediary traders. Based on the calculation of marketing efficiency in marketing channels, marketing of tilapia seeds, the marketing efficiency is 7.8% and is in the range of 0-33% so that the marketing of tilapia seeds in this group is classified as efficient.

The Mina Guna Sejahtera group needs to develop a tilapia rearing business to reach consumption levels in the Tajen area and its surroundings and not depend on intermediaries in marketing the seeds so that market opportunities become bigger and prices are more competitive. In addition, it is necessary to establish marketing centers for fish both seeds and consumption measures at the producer level, so that farmers can market directly to consumers and increase the value of farmer share.

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